# Water Supply Outlook

## California and Northern Nevada

January 2010

California Nevada River Forecast Center
NOAA - National Weather Service
Sacramento, California

www.cnrfc.noaa.gov/water_supply

# DEFINITIONS:

**Acre-Feet:** The volume equal to one acre covered one foot deep (43,560 cubic feet).

**Forecast Period:** Generally, April 1st through July 31st, unless otherwise noted.

**April-High Forecast Period:** For the Lake Tahoe Stage Rise, the period from April 1st to the highest recorded lake stage level.

**April 1st Average:** The April 1st snowpack average is used as a reference point because it is normally the end of the winter snowfall season and the beginning of the spring runoff season.

**Residual Period:** The forecast period from the first of the current month through September 30th.

**Probability Forecasts:** Precipitation and snowfall accumulation of known probability as determined by analysis of past records are utilized in the preparation of probability runoff forecasts. The forecasts include an evaluation of the standard error of the prediction model. The forecasts are presented at three levels of probability as follows:

- **Most Probable Volume:** Given the current hydrometeorological conditions to date, this is the best estimate of what the actual runoff volume will be this season.
- **Most Probable Volume (% Normal):** Most probable volume in percent of the 1961-1990 average.
- **Reasonable Maximum Volume:** Given current hydrometeorological conditions, the seasonal runoff that has a 10 percent chance of being exceeded.
- **Reasonable Minimum Volume:** Given current hydrometeorological conditions, the seasonal runoff that has a 90 percent chance of being exceeded.

**SNOTEL:** Acronym for SNOw TELemetry. This is a automated snow measurement system operated by the USDA - Natural Resources Conservation Service. These sites use meteor burst communications technology to transmit hydrometeorological information such as snow water equivalent from snow pillows, accumulated precipitation and maximum, minimum and average air temperature.

**Water equivalent:** The depth of water that would result from melting the snowpack at a point.

**Water Year:** The period from October 1st through September 30th.

# General Outlook

**January 1, 2010**

The California-Nevada region began water year 2010 on the heels of a third consecutive year of below average spring runoff. Although the water supply season got off to a good start with a wet mid-October storm event, November turned out to be dry and a somewhat wetter December was not enough to compensate for the below average hydrologic conditions facing many watersheds in California and Nevada on January 1st. This month's early forecasts are calling for below average to near average spring runoff with the best projections from the Stanislaus River basin to the Kings. However, much of the water supply season remains, and a steady series of storms is required to alleviate the dry conditions during the past three years.

December precipitation ranged from much below average for the lower Klamath basin to much above average for the central and southern Sierra Nevada, with much above average precipitation occurring from the Tuolumne basin to the Kern. Seasonal precipitation (October 1st to December 31st) was generally below average in the upper Klamath, Trinity, upper Sacramento and northern Sierra Nevada basins. Seasonal averages range from near average to above average from the Tuolumne to the Kern basins. Seasonal averages are below average for eastern Nevada watersheds.

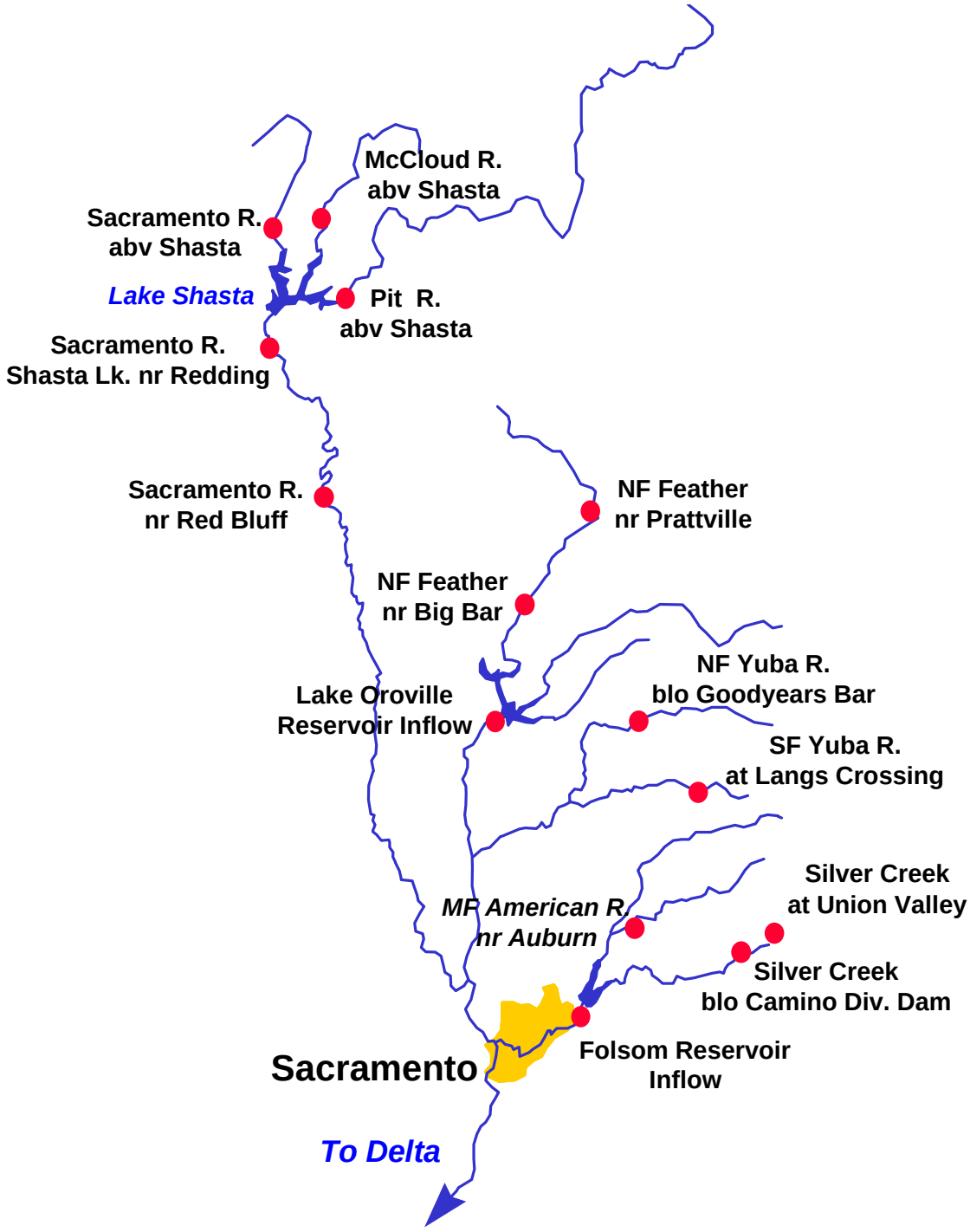
Snow accumulation as of January 1st, 2010 is roughly comparable to last year at this time for the upper Sacramento-Sierra Nevada region. As of January 1, the April 1st average stands at approximately 31 percent for the Shasta-northern Sierra, 28 percent for the central and 36 percent for the southern Sierra. Snow packs in the Tahoe-Truckee are about 86 percent of the percent of the average-to-date, the Carson-Walker at 85 percent and the Humboldt basin at 57 percent. The pack stands at about 80 percent of the average-to-date for the Upper Klamath Lake basin. It was 72 percent in the Humboldt and 98 percent for the Upper Klamath Lake basin at this time last year.

Runoff was much below average for the region during December ranging from 29 percent for the Trinity-Sacramento, 58 percent for the San Joaquin drainage, and 58 percent for the Tulare Lake watershed. East side Sierra basins received 60 percent of a December average while the Humboldt River at Palisade recorded approximately 53 percent. The Upper Klamath Lake inflow was 57 percent of a December average.

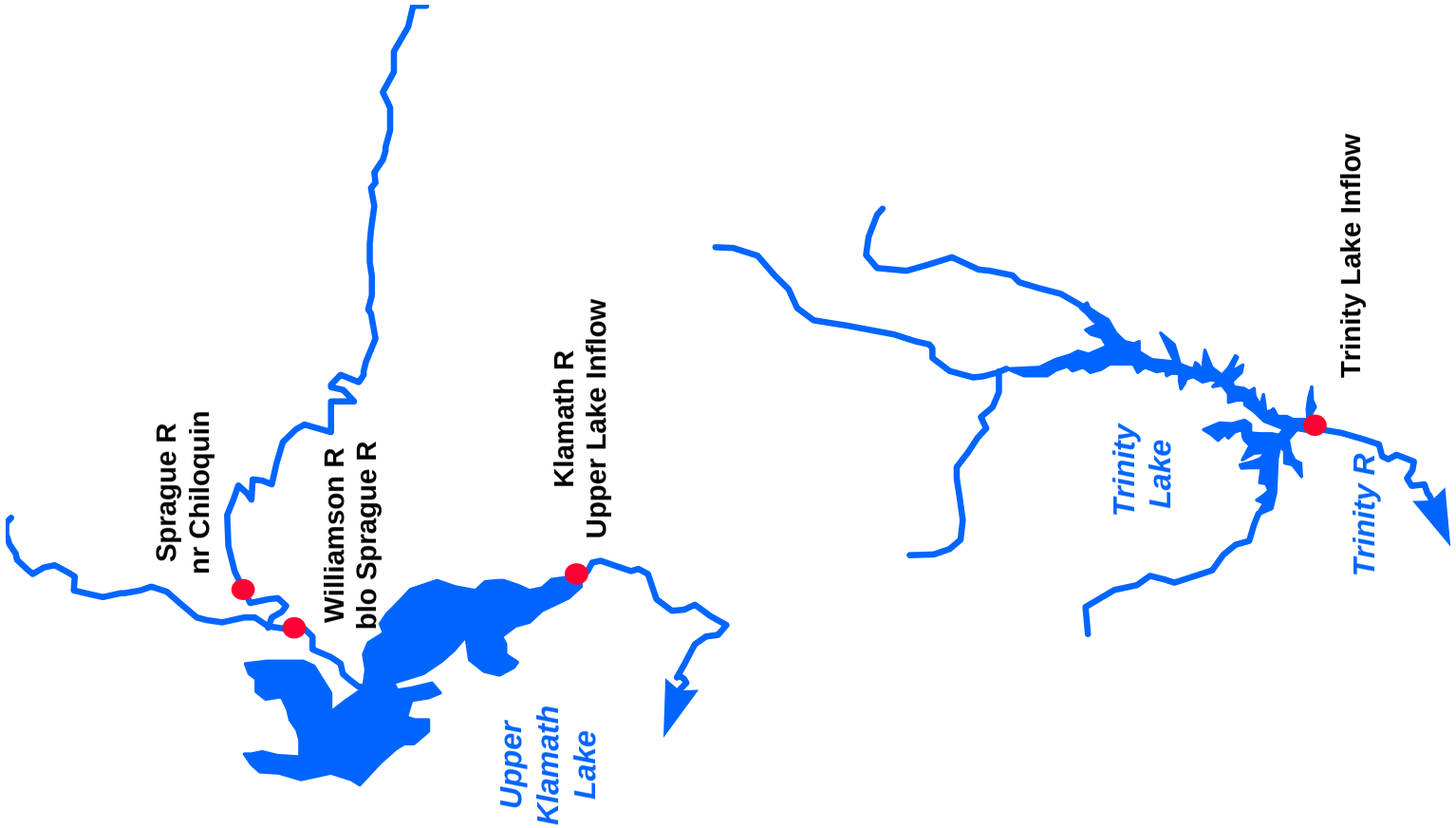
Carryover storage remains well below average for some of California's major reservoirs. However, there has been some overall improvement over last year at this time, especially in the San Joaquin and Tulare Lake regions. Storage for the two key reservoirs in northern California continues to be much below average with Shasta Lake at 64 percent of average and Lake Oroville at 45 percent. Stored water in the Sacramento region as of December 31st was at 69 percent of average for the date (as opposed to 64 percent for the date last year), the San Joaquin at 92 percent (73 percent last year), and the Tulare Lake watershed at 80 percent (57 percent last year). East-side Sierra reservoirs were at 77 percent of average. The lake level at Lake Tahoe stood at 6222.78 feet as of December 31st and the water level is below the natural rim. Storage at Lahontan Reservoir in Nevada stands at an estimated 13 percent of average as of December 31st while Rye Patch Reservoir is at 13 percent. Storage at Upper Klamath Lake is about 50 percent of average.

April through July runoff forecasts varies from 60 percent for the Feather River basin to about 94 percent of average for the Kings. On a positive note, most forecasts are in the 85 to 90 percent range from the Stanislaus to the Kings. Forecasts range from 59 to 80 percent of average for the east side Sierra Nevada basins and 37 to 52 percent for forecast points on the main stem Humboldt River. The April through September forecast for the Upper Klamath Lake inflow is 72 percent.

# Sacramento River Basin



# Upper Klamath and Trinity River Basins



# Water Supply Forecasts

## COASTAL BASINS

| | | Most Prob Vol KAF | Most Prob Vol %Norm | Reas Max Vol KAF | Reas Min Vol KAF | 30 Year Avg KAF |
|---|---|---|---|---|---|---|
| **Williamson River** | | | | | | |
| Sprague, blo | Apr-Sep | 290 | 75 | 425 | 157 | 385 |
| **Sprague River** | | | | | | |
| Chiloquin, nr | Apr-Sep | 165 | 72 | 275 | 53 | 230 |
| **Upper Klamath Falls River** | | | | | | |
| Inflow | Apr-Sep | 370 | 72 | 610 | 132 | 515 |
| **Lost River** | | | | | | |
| Gerber Reservoir Inflow | Feb-Jul | 25 | 53 | 63 | 2.0 | 47 |
| Clear Lake Reservoir Inflow | Feb-Jul | 75 | 71 | 160 | 4.0 | 105 |
| **Scott River** | | | | | | |
| Fort Jones, nr | Apr-Jul | 115 | 64 | 250 | 45 | 181 |
| **Trinity River** | | | | | | |
| Trinity Lake Inflow | Apr-Jul | 440 | 69 | 820 | 270 | 635 |

## SACRAMENTO RIVER BASIN

| | | Most Prob Vol KAF | Most Prob Vol %Norm | Reas Max Vol KAF | Reas Min Vol KAF | 30 Year Avg KAF |
|---|---|---|---|---|---|---|
| **SACRAMENTO RIVER ABOVE BEND BRIDGE** | | | | | | |
| **Pit River** | | | | | | |
| Montgomery Ck, nr | Apr-Jul | 700 | 65 | 1100 | 540 | 1070 |
| **Mccloud River** | | | | | | |
| Shasta Lake, abv | Apr-Jul | 310 | 84 | 470 | 205 | 370 |
| **Sacramento River** | | | | | | |
| Delta | Apr-Jul | 235 | 81 | 425 | 125 | 290 |
| Shasta Dam | Apr-Jul | 1350 | 75 | 2210 | 890 | 1790 |
| Bend Bridge, abv, Red Bluff, nr | Apr-Jul | 1800 | 74 | 3130 | 1020 | 2440 |

# Water Supply Forecasts

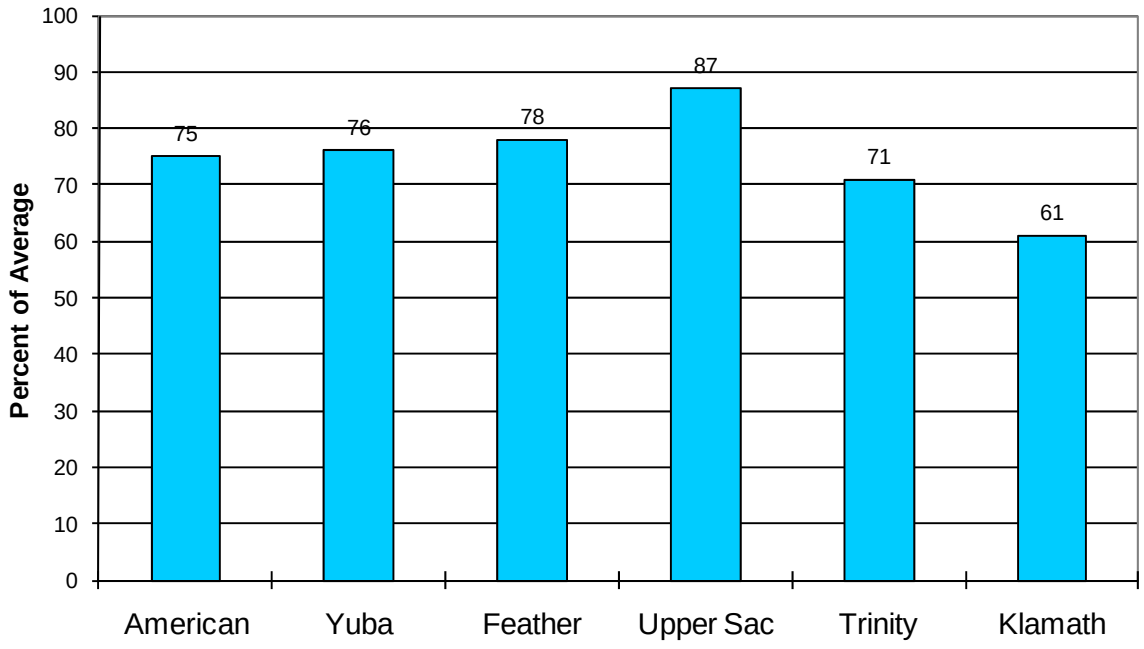
| | | Most Prob Vol KAF | Most Prob Vol %Norm | Reas Max Vol KAF | Reas Min Vol KAF | 30 Year Avg KAF |
|---|---|---|---|---|---|---|
| **FEATHER RIVER ABOVE OROVILLE RESERVOIR** | | | | | | |
| North Fork Feather River | | | | | | |
| Prattville, nr | Apr-Jul | 210 | 63 | 370 | 135 | 333* |
| Big Bar | Apr-Jul | 590 | 61 | 1300 | 320 | 962* |
| Feather River | | | | | | |
| Oroville Dam | Apr-Jul | 1060 | 60 | 2200 | 420 | 1760 |
| **YUBA RIVER ABOVE SMARTVILLE** | | | | | | |
| North Yuba River | | | | | | |
| Goodyears Bar, blo | Apr-Jul | 215 | 79 | 380 | 95 | 273* |
| South Yuba River | | | | | | |
| Langs Crossing | Apr-Jul | 175 | 78 | 310 | 75 | 225* |
| Yuba River | | | | | | |
| Englebright Reservoir | Apr-Jul | 740 | 74 | 1420 | 280 | 995 |
| **AMERICAN RIVER ABOVE FOLSOM RESERVOIR** | | | | | | |
| Middle Fork American River | | | | | | |
| Auburn, nr | Apr-Jul | 355 | 72 | 680 | 220 | 490* |
| Silver Ck | | | | | | |
| Union Valley | Apr-Jul | 85 | 87 | 135 | 45 | 98* |
| Camino Dam, blo | Apr-Jul | 125 | 79 | 235 | 70 | 158* |
| American River | | | | | | |
| Folsom Reservoir | Apr-Jul | 990 | 80 | 1800 | 500 | 1230 |

***30 Year Averages for 1971-2000 are incomplete. Those forecast points with an asterisk have incomplete averages, so 1961-1990 averages are listed. The new averages will be incorporated into this report when the complete data sets become available.**

# Sacramento/Trinity/Klamath River Basins

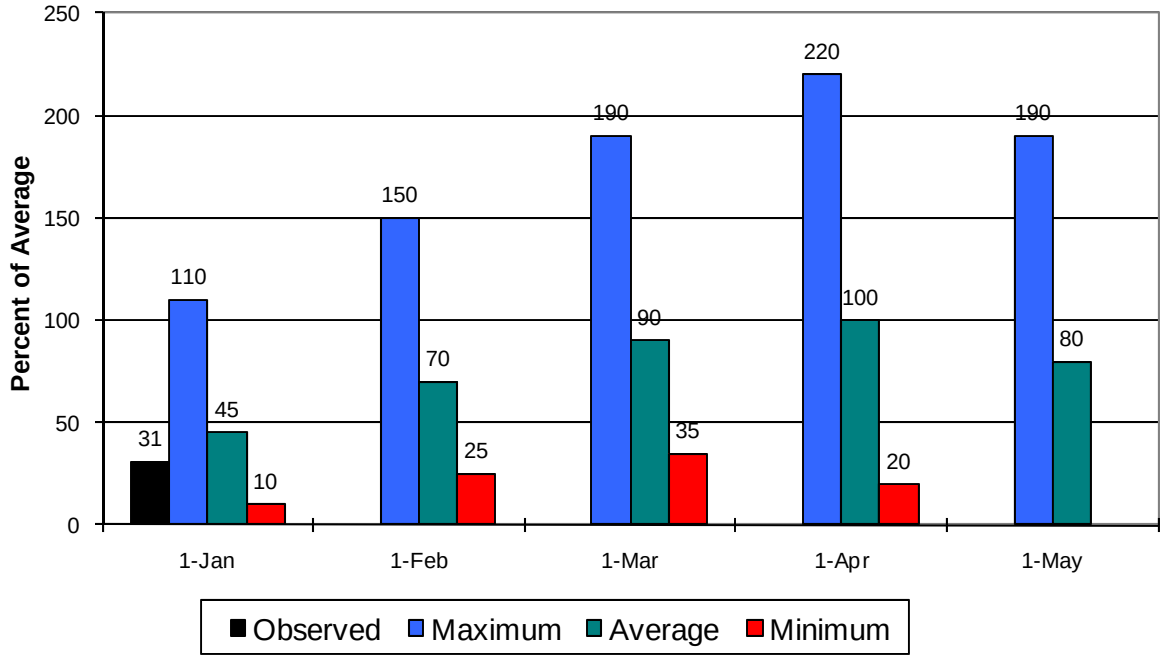
## Seasonal Basin Precipitation

**October 1 to Date**




## Seasonal Basin Snowpack

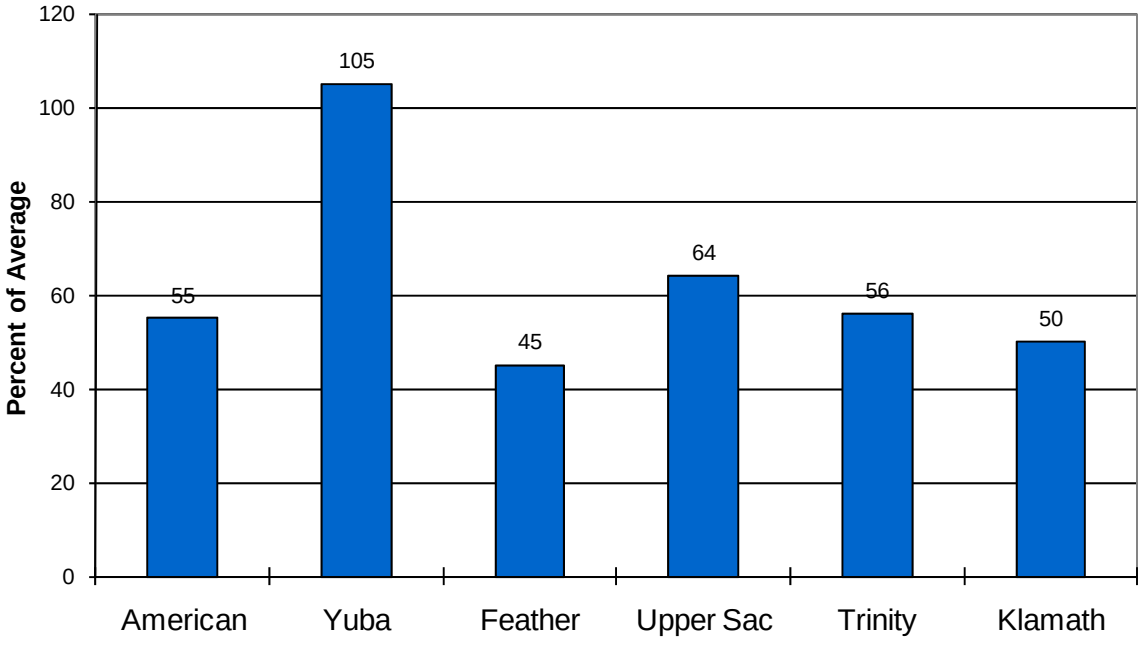
**Water Content in % of April 1 Average**



# Sacramento/Trinity/Klamath River Basins

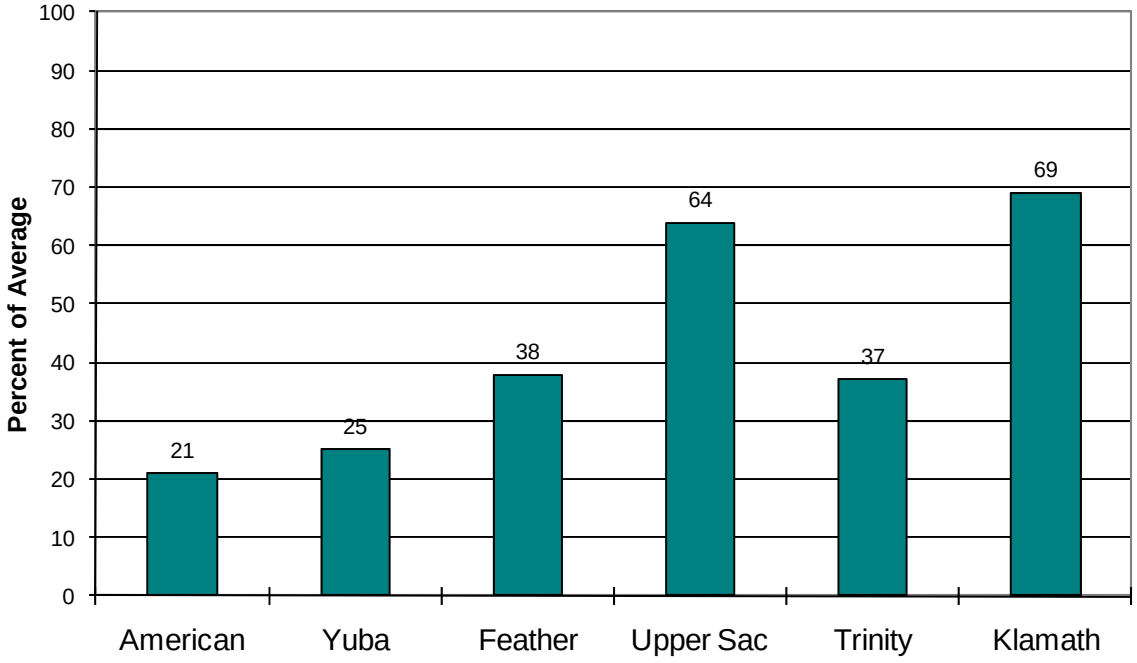
## Basin Reservoir Storage

**Contents of Major Reservoirs in % of Average**




## Seasonal Basin Runoff

**October 1 to Date**



# San Joaquin Basin

# Water Supply Forecasts

## SAN JOAQUIN BASIN

| | | Most Prob Vol KAF | Most Prob Vol %Norm | Reas Max Vol KAF | Reas Min Vol KAF | 30 Year Avg KAF |
|---|---|---|---|---|---|---|
| **South Fork San Joaquin River** | | | | | | |
| Hooper Ck, blo, Florence Lk, nr | Apr-Jul | 182 | 95 | 315 | 70 | 192* |
| **San Joaquin River** | | | | | | |
| Millerton Lake | Apr-Jul | 1170 | 92 | 2100 | 400 | 1270 |
| **Merced River** | | | | | | |
| Pohono Bridge, at, Yosemite, nr | Apr-Jul | 360 | 100 | 625 | 150 | 360* |
| Merced Falls, blo | Apr-Jul | 580 | 90 | 1150 | 225 | 645 |
| **Tuolumne River** | | | | | | |
| Hetch Hetchy, nr | Apr-Jul | 560 | 94 | 975 | 300 | 596* |
| La Grange, nr | Apr-Jul | 1110 | 90 | 2000 | 500 | 1230 |
| **Middle Fork Stanislaus River** | | | | | | |
| Beardsley Dam, blo | Apr-Jul | 275 | 86 | 525 | 150 | 320* |
| **Stanislaus River** | | | | | | |
| New Melones Dam | Apr-Jul | 590 | 85 | 1100 | 300 | 695 |
| **NF Mokelumne River** | | | | | | |
| West Point | Apr-Jul | 320 | 77 | 640 | 130 | 416* |
| **Mokelumne River** | | | | | | |
| Pardee Reservoir | Apr-Jul | 350 | 76 | 660 | 140 | 460 |
| **Cosumnes River** | | | | | | |
| Michigan Bar | Apr-Jul | 95 | 77 | 235 | 25 | 123 |

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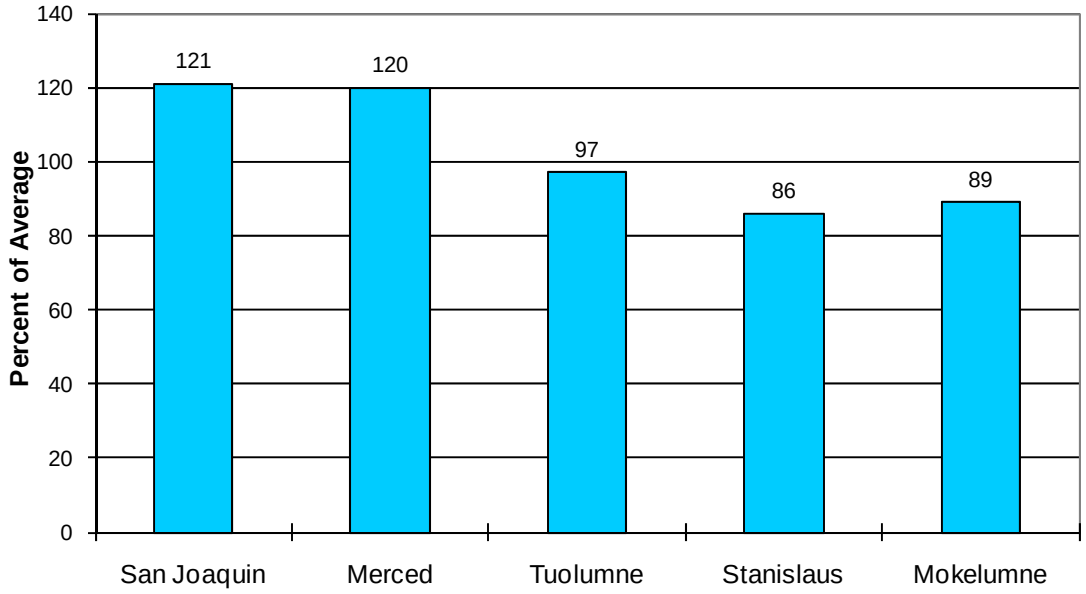
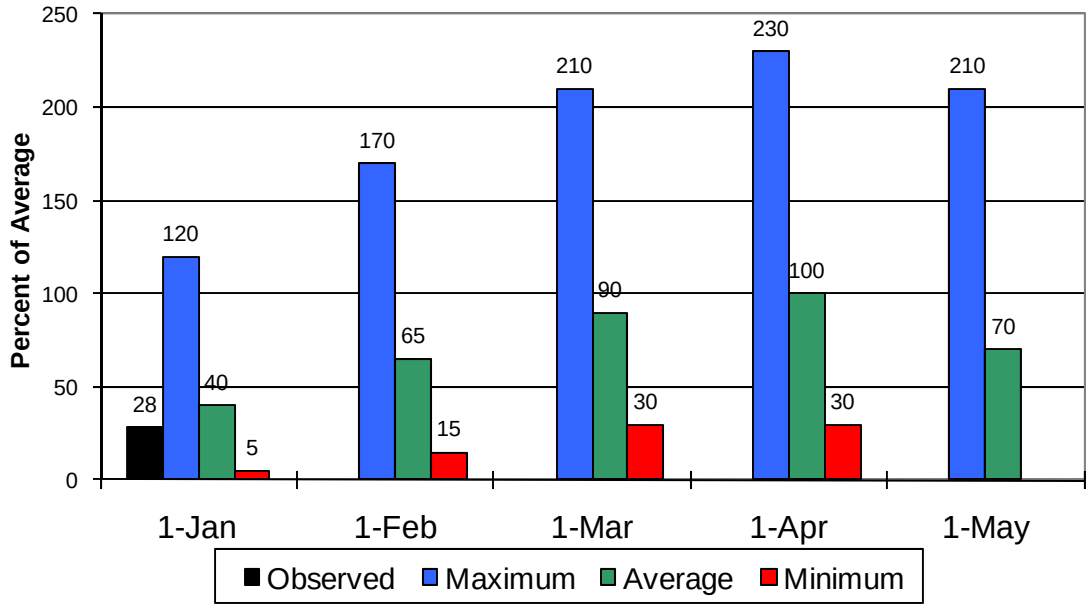
# San Joaquin Basin

## Seasonal Basin Precipitation
**October 1 to Date**

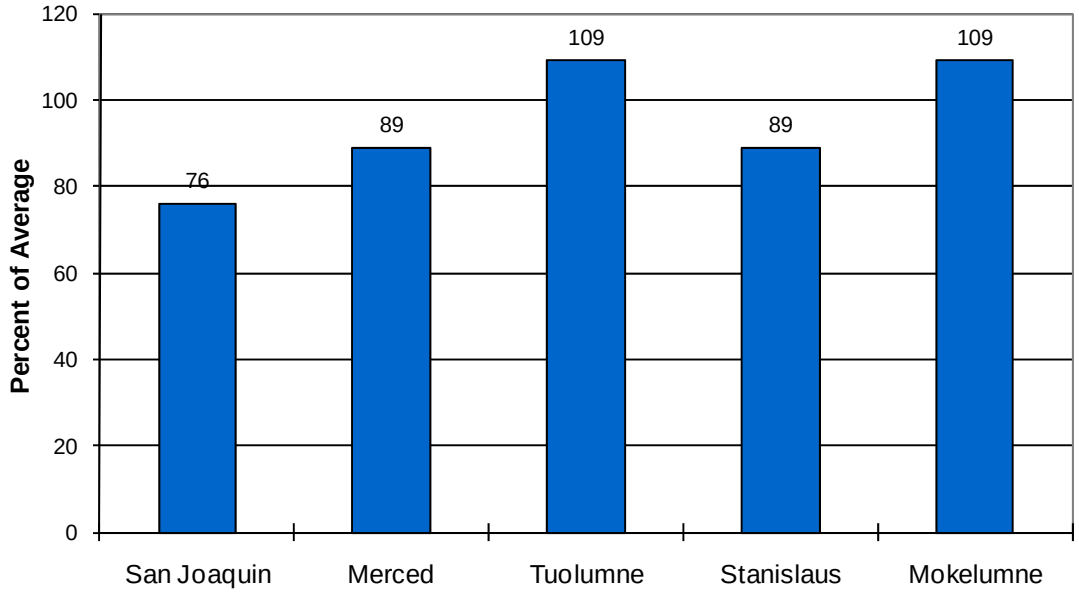



## Seasonal Basin Snowpack
**Water Content in % of April 1 Average**

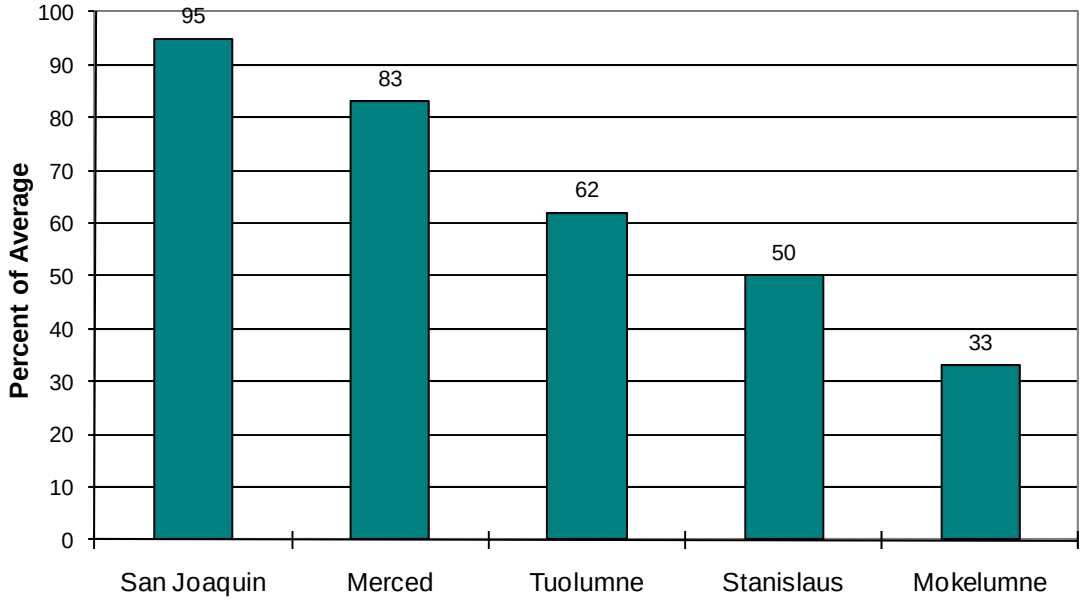


# San Joaquin Basin

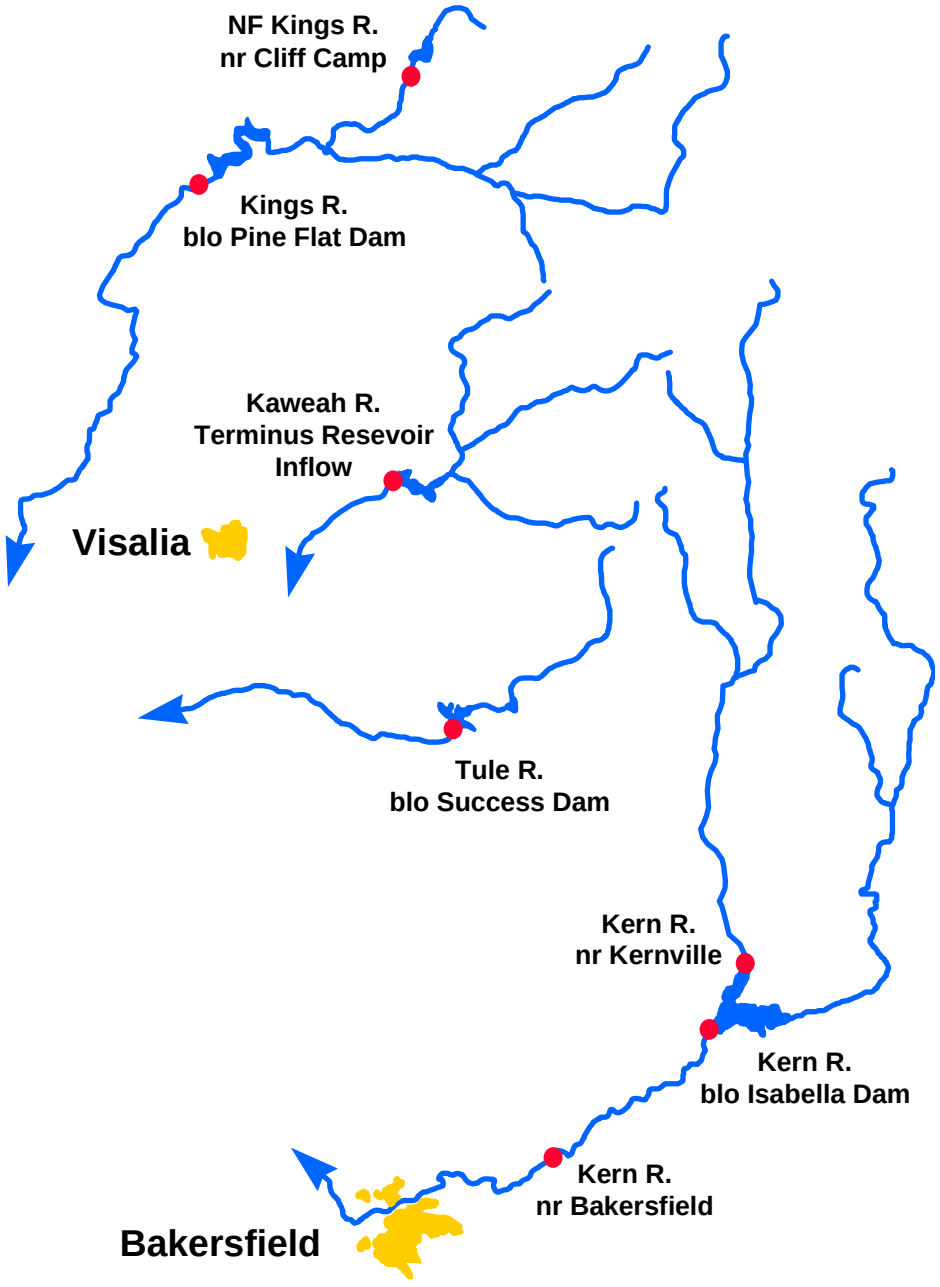
## Basin Reservoir Storage
### Contents of Major Reservoirs in % of Average




## Season Basin Runoff
### October 1 to Date



# Tulare Basin



# Water Supply Forecasts

## TULARE LAKE BASIN

| | | Most Prob Vol KAF | Most Prob Vol %Norm | Reas Max Vol KAF | Reas Min Vol KAF | 30 Year Avg KAF |
|---|---|---|---|---|---|---|
| **Kern River** | | | | | | |
| Kernville, nr | Apr-Jul | 340 | 85 | 800 | 100 | 398* |
| Isabella Dam, blo | Apr-Jul | 415 | 86 | 975 | 115 | 480 |
| Bakersfield, nr | Apr-Jul | 425 | 87 | 1000 | 110 | 490 |
| **Tule River** | | | | | | |
| Success Dam | Apr-Jul | 50 | 76 | 140 | 11.0 | 66 |
| **Kaweah River** | | | | | | |
| Terminus Dam | Apr-Jul | 260 | 90 | 575 | 80 | 290 |
| **North Fork Kings River** | | | | | | |
| Cliff Camp, nr | Apr-Jul | 235 | 98 | 400 | 100 | 240* |
| **Kings River** | | | | | | |
| Pine Flat Dam, blo | Apr-Jul | 1180 | 94 | 2100 | 550 | 1250 |

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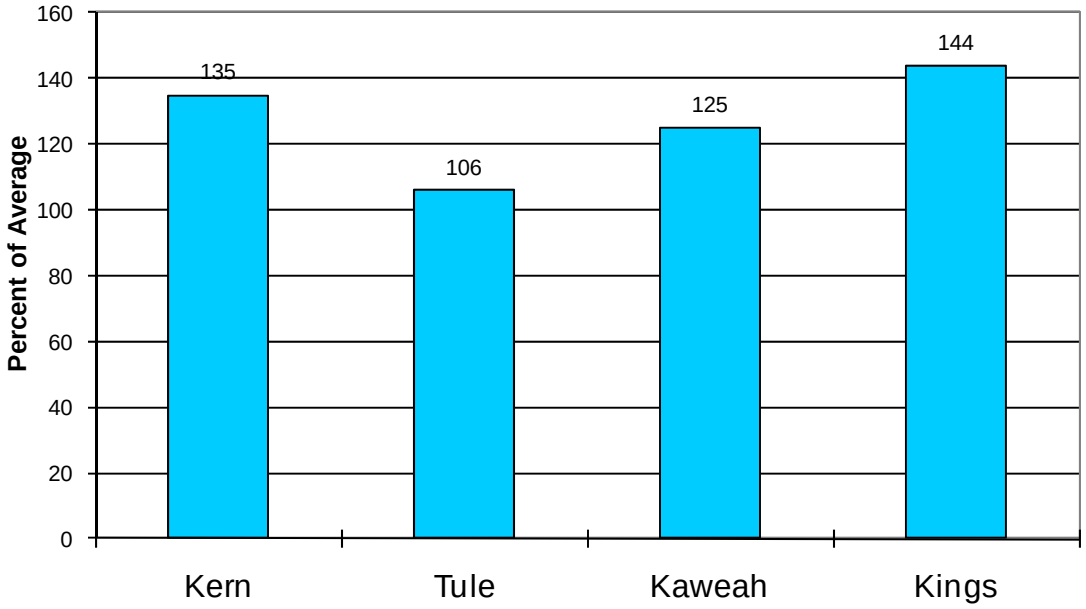
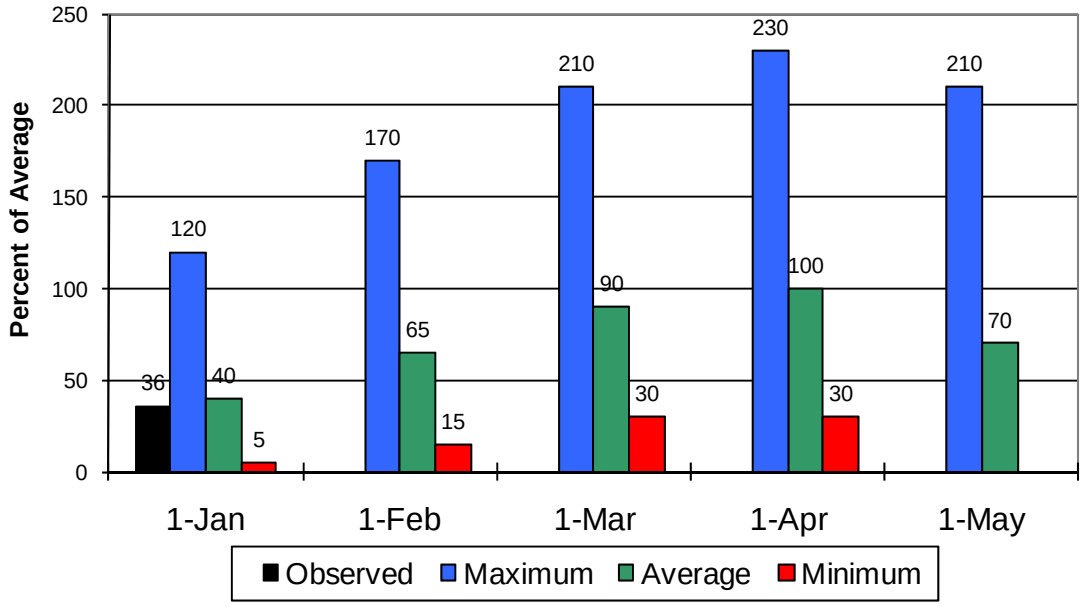
# Tulare Lake Basin

## Seasonal Precipitation
**October 1 to Date**



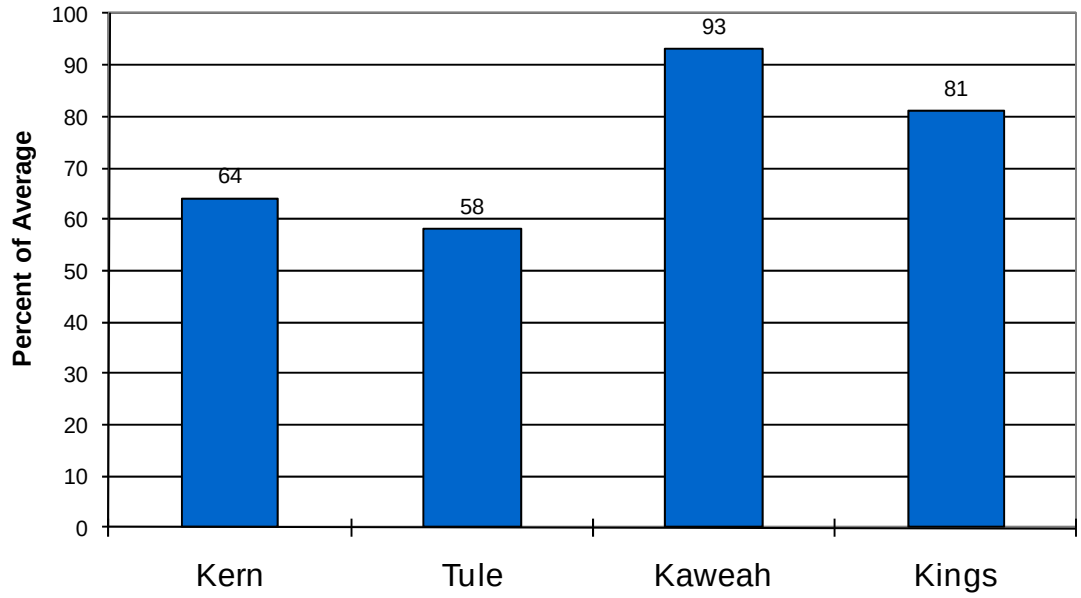

## Seasonal Basin Snowpack
**Water Content in % of April 1 Average**



# Tulare Lake Basin

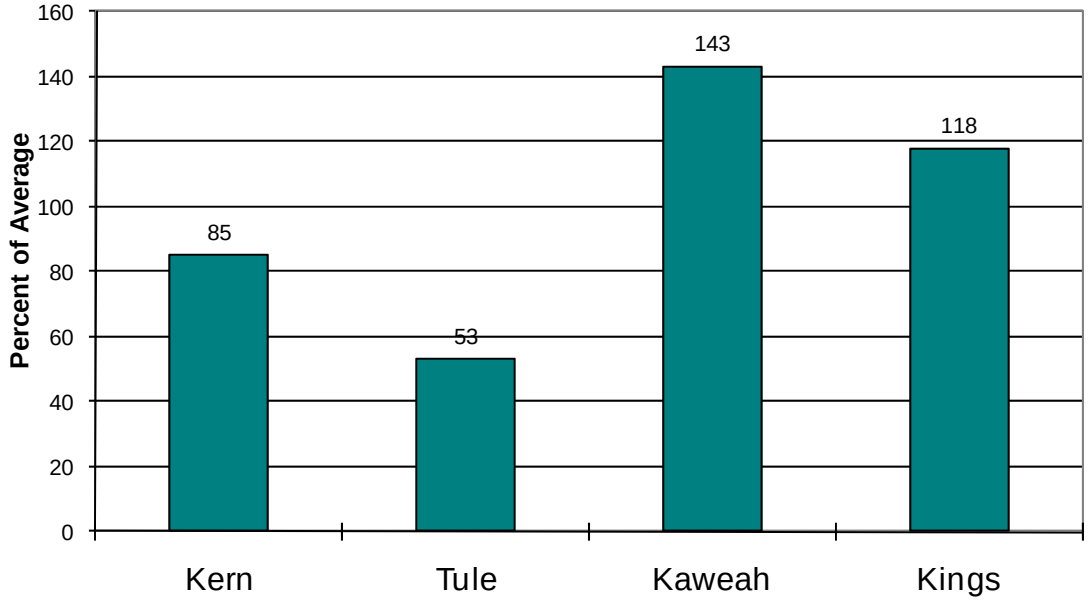
## Basin Reservoir Storage

**Contents of Major Reservoirs in % of Average**

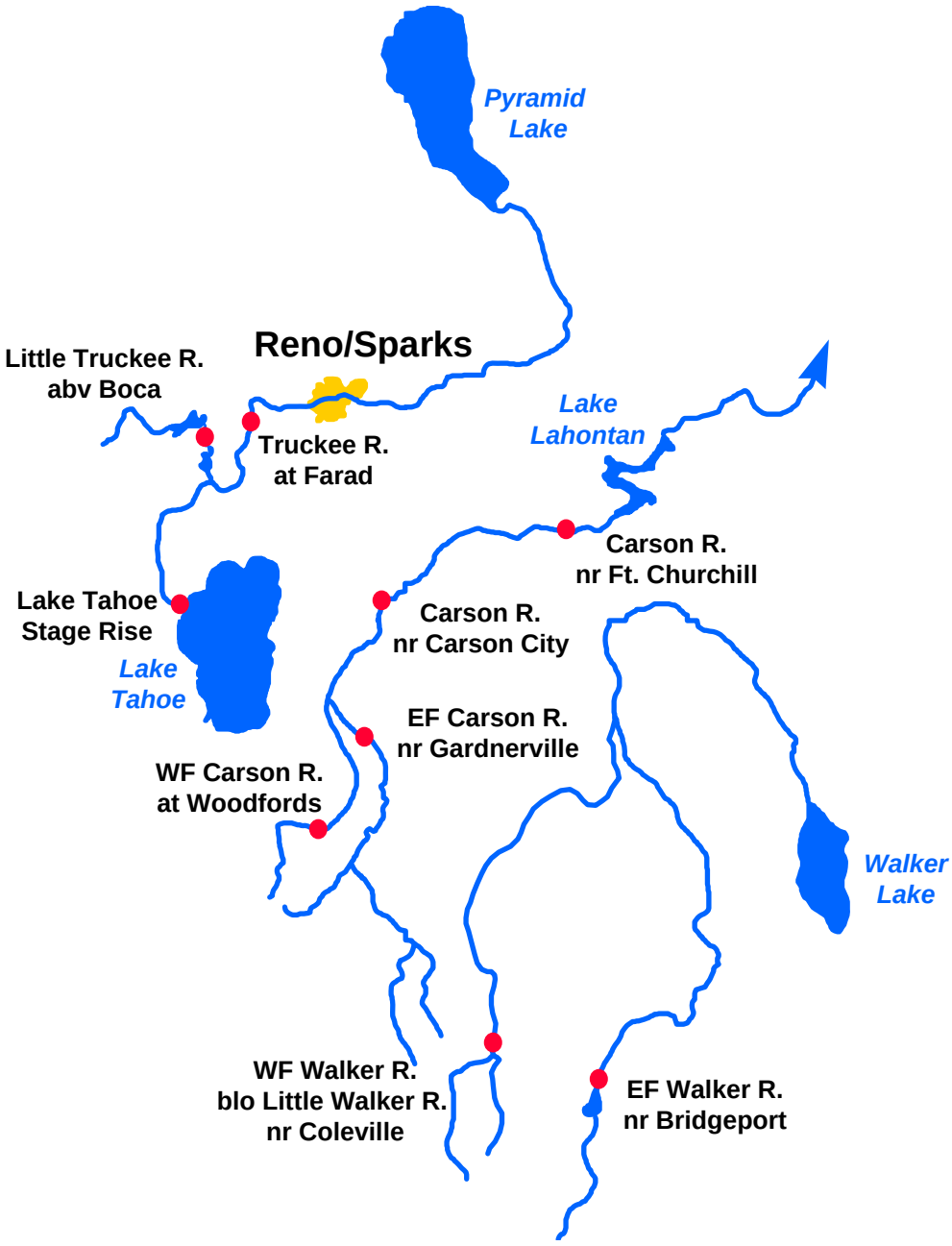



## Seasonal Basin Runoff

**October 1 to Date**



# East Side Sierra Nevada Basins



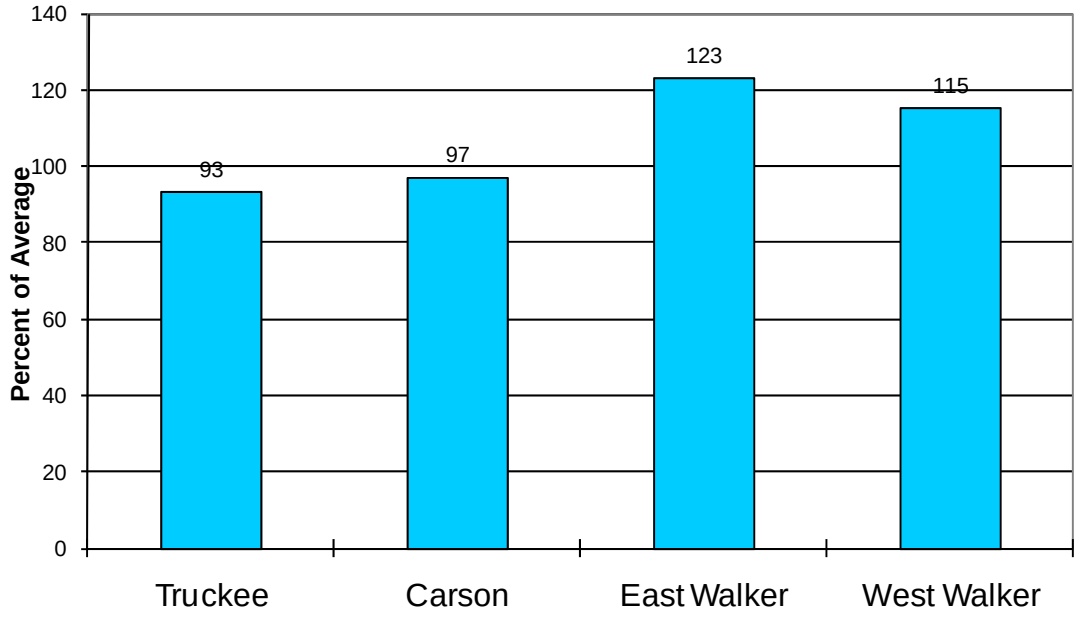
# Water Supply Forecasts

## EAST SIDE SIERRA NEVADA BASINS

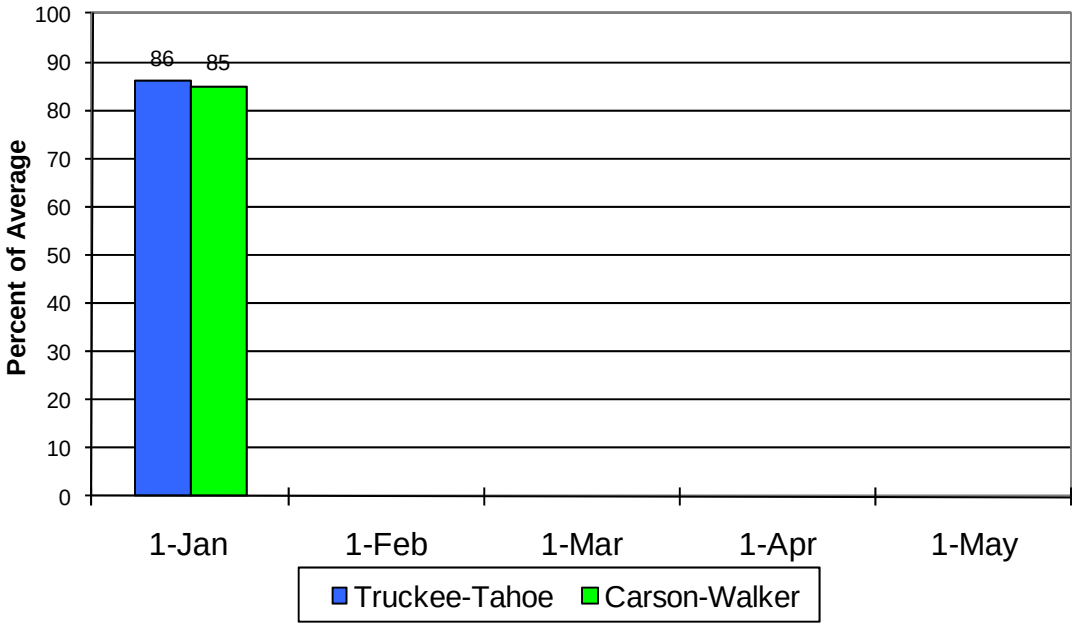
| | | Most Prob Vol KAF | Most Prob Vol %Norm | Reas Max Vol KAF | Reas Min Vol KAF | 30 Year Avg KAF |
|---|---|---|---|---|---|---|
| **Truckee River** | | | | | | |
| Truckee River | | | | | | |
| Lake Tahoe Stage Rise | Apr-High | 0.90 | 65 | 2.0 | 0.28 | 1.38 |
| Little Truckee River | | | | | | |
| Stampede Dam | Apr-Jul | 58 | 72 | 131 | 26 | 80 |
| Truckee River | | | | | | |
| Farad | Apr-Jul | 190 | 73 | 305 | 73 | 260 |
| **Carson River** | | | | | | |
| East Fork Carson River | | | | | | |
| Gardnerville, nr | Apr-Jul | 145 | 77 | 260 | 29 | 189 |
| West Fork Carson River | | | | | | |
| Woodfords | Apr-Jul | 42 | 75 | 76 | 7.8 | 56 |
| Carson River | | | | | | |
| Carson City, nr | Apr-Jul | 110 | 59 | 275 | 20 | 188 |
| Fort Churchill, nr | Apr-Jul | 105 | 59 | 173 | 37 | 178 |
| **Walker River** | | | | | | |
| East Walker River | | | | | | |
| Bridgeport, nr | Apr-Aug | 52 | 78 | 93 | 11.1 | 67 |
| West Walker River | | | | | | |
| Coleville, nr | Apr-Jul | 125 | 80 | 205 | 45 | 156 |

# East Side Sierra Nevada Basins

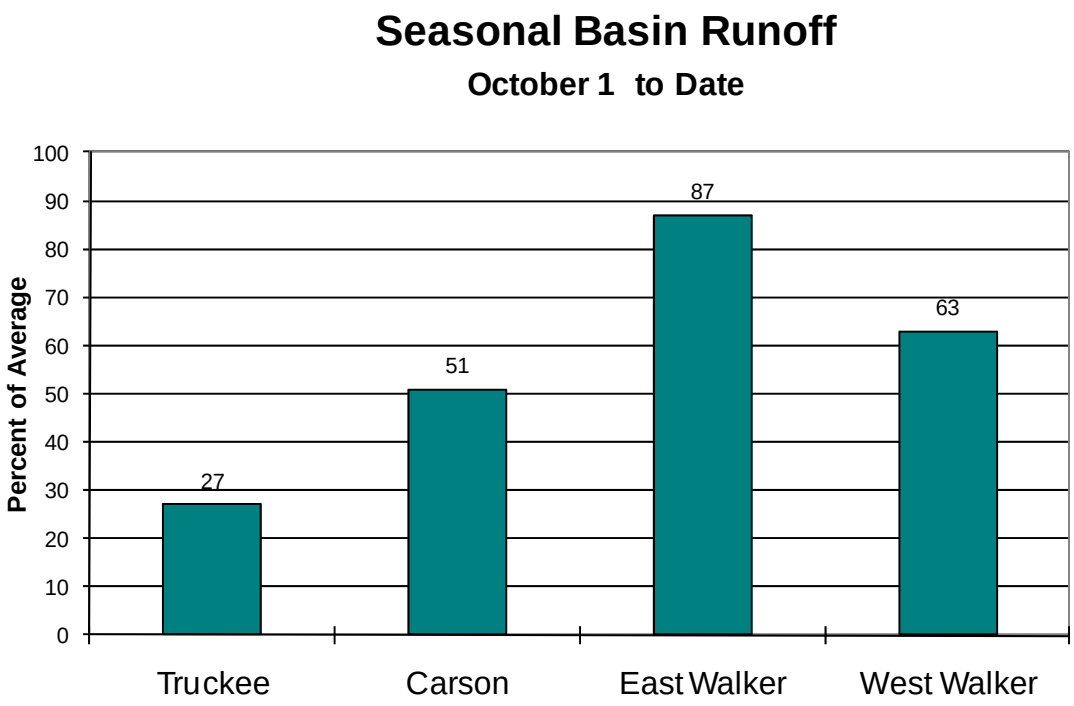
## Seasonal Basin Precipitation
**October 1 to Date**



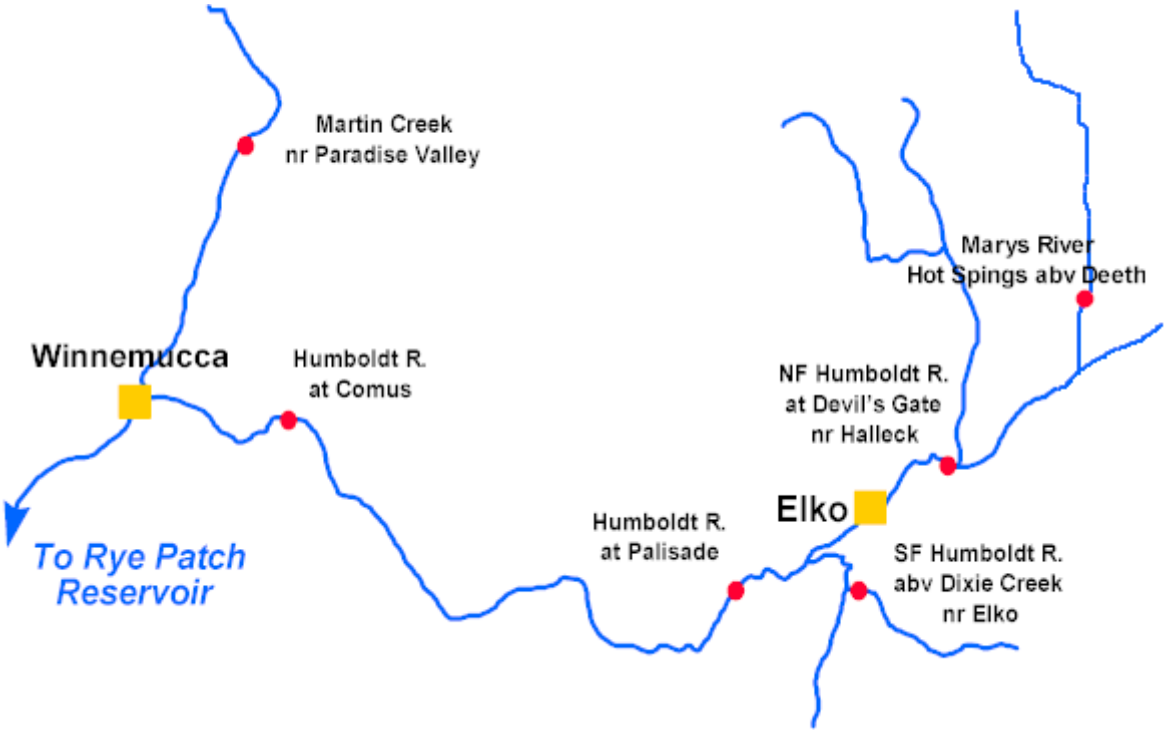

## Basin Snowpack
**% of Average SWE to Date**



# East Side Sierra Nevada Basins



# Humboldt River Basin




# Water Supply Forecasts

| | | Most Prob Vol KAF | Most Prob Vol %Norm | Reas Max Vol KAF | Reas Min Vol KAF | 30 Year Avg KAF |
|---|---|---|---|---|---|---|
| **North Fork Humboldt River** | | | | | | |
| Devils Gate, at, Halleck, nr | Apr-Jul | 19.0 | 56 | 36 | 2.0 | 34* |
| **South Fork Humboldt River** | | | | | | |
| Dixie Ck, abv, Elko, nr | Apr-Jul | 53 | 70 | 124 | 2.0 | 76 |
| **Marys River** | | | | | | |
| Hot Springs, abv, Deeth, nr | Apr-Jul | 22 | 56 | 40 | 4.0 | 39 |
| **Humboldt River** | | | | | | |
| Elko, nr | Apr-Jul | 77 | 50 | 168 | 5.0 | 154 |
| Palisade | Apr-Jul | 130 | 52 | 235 | 25 | 250 |
| Comus | Apr-Jul | 115 | 51 | 240 | 7.0 | 225 |
| Imlay, nr | Apr-Jul | 70 | 37 | 215 | 2.0 | 188 |
| **Martin Creek** | | | | | | |
| Paradise Valley, nr | Apr-Jul | 8.0 | 43 | 21 | 1.00 | 18.7 |

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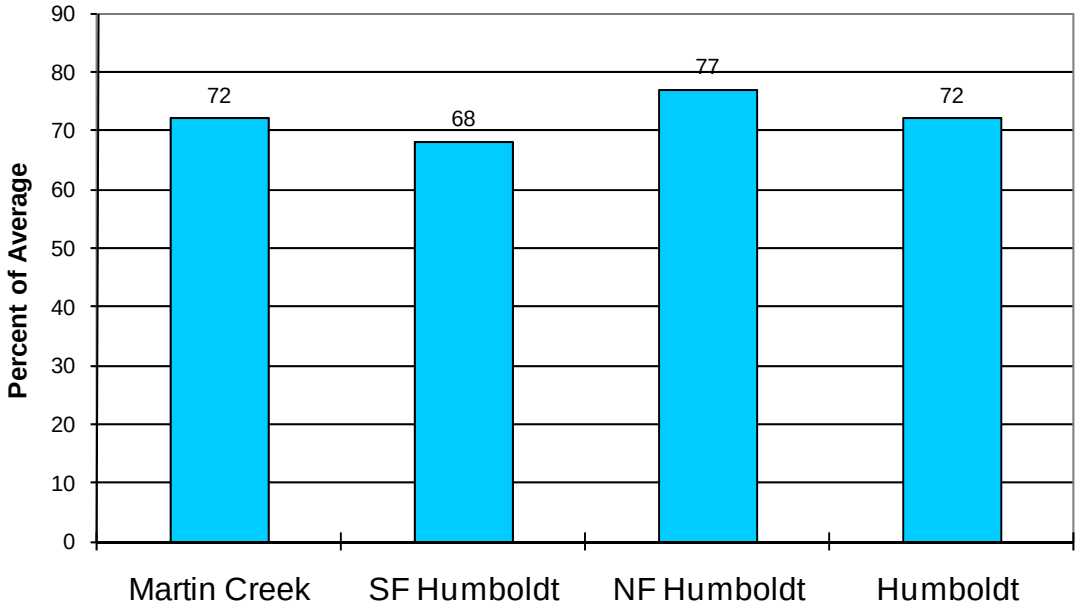
# Humboldt River Basin

## Seasonal Basin Precipitation
**October 1 to Date**




## Basin Snowpack
**% of Average SWE to Date**